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JUL 8 1926

BULLETIN

OF

THE NEW YORK ACADEMY OF MEDICINE

INSTITUTED 1847

SECOND SERIES, VOL. 1, No. 3

MAY, 1925

PUBLISHED MONTHLY BY
THE NEW YORK ACADEMY OF MEDICINE
LANCASTER, PA. Lime & Green Sts.
NEW YORK 17 W. 43d St.

1925

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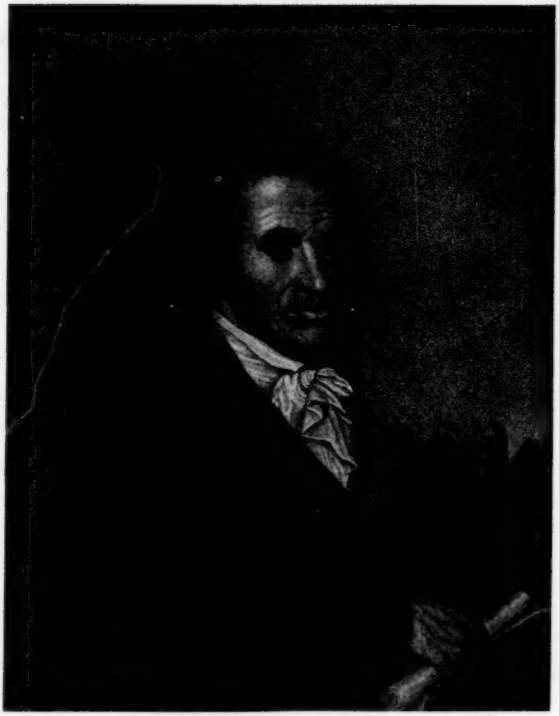

SAMUEL BARD, M.D.

1742-1821

(From a painting by Vanderlyn, printed by Ridley, in "American Medical Biography: or, Memoirs of Eminent Physicians who Have Flourished in America," by Dr. James Thacher, Boston: Richardson & Lord and Cotton & Barnard, 1828.)

THE NEW YORK
ACADEMY OF MEDICINE

VOL. 1 MAY, 1925 No. 3

SAMUEL BARD AND THE KING'S COLLEGE SCHOOL

In February, 1752, through the labors of Dr. Thomas Bond and Benjamin Franklin, the Pennsylvania Hospital was opened in a house on the south side of Market Street, Philadelphia. The year 1765 witnessed the foundation of the Medical Department of the University of Pennsylvania by John Morgan and William Shippen. Three years later, the Medical School of King's College, was established in New York (1768), largely through the zeal and devotion of Dr. Samuel Bard, but while the Philadelphia school was our earliest foundation for systematic medical teaching, the first M.D. degree was actually conferred by the New York school upon Robert Tucker in 1770. Morgan and Bard had, in fact, been fellow students at the University of Edinburgh, each aspiring, without rivalry, to establish a medical school in his city. Both graduated from Edinburgh in the same year (1765), but even though Morgan returned to America ten months before Bard, the earlier foundation was unquestionably due to his more resolute and energetic character. His coadjutor, Shippen, an Edinburgh graduate of 1762, had been in Philadelphia no less than three years before the cherished project became accomplished fact.

Samuel Bard [1742–1821], the son of Dr. John Bard (1716–89), was descended on both sides of his house from French refugees, exiled by the revocation of the Edict of Nantes. Peter Bard, the grandfather, came to Delaware in 1703, subsequently settling in Burlington, N. J., where he became judge of the Supreme Court and a member of the Governor's council. He died at an early age, and upon his widow, the daughter of an

English physician, devolved the care and education of a family of seven. John Bard was educated in Philadelphia, where, at the age of 15, he was indentured to Mr. Kearsley, an English surgeon, who subjected his pupils to that harsh round of menial employments which was the portion of physician's apprentices in the eighteenth century. The medical education thus acquired was brightened by an early intimacy with Benjamin Franklin who remained Bard's friend for life. Starting practice in Philadelphia, John Bard, married Miss Valleau, equally poor and a descendant of French refugees. In 1746, at the instance of Franklin, he moved to New York, where he soon acquired a large practice among the well-to-do, through his tact, and ability, his Gallic talent for cheerful conversation and his remarkable memory for apposite quotations. In 1759, a Dutch ship laden with cases of malignant ship (typhus) fever entered New York Harbor and Bard was selected to devise means for quarantine. One result was the eventual purchase of Bedloe's Island, the erection of a pest house on this station, and the appointment of Bard as health officer. In 1759, the first recorded dissection in the Colonies was made by Bard and Peter Middleton, upon the body of Hermannus Carroll, an executed murderer. In the same year (1759), Bard performed one of the earliest successful operations for ectopic pregnancy. He contributed other papers on malignant pleurisy (1749) and yellow fever to "A Weekly Society of Gentlemen in New York," founded about the middle of the eighteenth century and probably our earliest medical society. John Bard was a striking example of Osler's observation that physicians are as easily victimized by speculative investments as are high financiers by quacks. Having retired from practice in 1778, he was, by 1784, in such bad financial straits from his experiments in mining and iron-founding, that his son had to apply his entire capital of 5,000 guineas to protect the Bard estate at Hyde Park. The elder Bard then resumed practice in New York, retiring again in 1797, to die at Hyde Park two years later.

The son, Samuel Bard, was born in Philadelphia on April 1, 1742, received his early education at a New York grammar school, entered King's College at the age of 14 (1756), studying medi-

cine at the same time under his father. He early acquired a taste for botany through the friendship of the daughter of the lieutenant-governor, Cadwallader Colden, (1688–1776), an Edinburgh medical graduate of rare scientific abilities, who settled in New York in 1716, wrote learned disquisitions on botany, gravitation, differential calculus, anthropology and yellow fever, and became one of the most eminent public officials in the colonies. In the fall of 1761, young Bard himself, after the fashion of the well-to-do, sailed overseas to pursue his medical studies at Edinburgh. On the way over, he was captured by a French privateer, and confined, with other prisoners of war, in a castle at Bayonne, to be released, six months later, through the good offices of the influential Franklin. In April, 1762, he arrives in London, is immediately taken up by Fothergill, that steadfast friend of colonial physicians, attends lectures for a while at Guy's and St. Thomas's, and eventually gets up Edinburgh by stage-coach in August. There he is received with the utmost cordiality by Cullen, Monro *primus*, Robert Whytt and "a Mr. Morgan from Philadelphia, a person of distinguished merit, who knew our family, and has taken particular notice of me." By December, Bard and Morgan are already planning to found medical schools in their respective cities, the elder Bard wisely counselling across the sea that a "public hospital" is New York's immediate need. During his five years residence in Edinburgh, young Bard's preceptor is Cullen's ungrateful protégé, John Brown, whose theory that diseases are merely degrees of tissue excitation caused riots in German university towns and who illustrated his therapeutic method in class by alternately fuddling himself with alcohol and opium. Of all this, nothing transpires in Bard's letters home, beyond the fact that his own graduation thesis "*De viribus opii*" (1765); a protocol of experiments on his own person, combats the then received view of opium as a stimulant and proclaims it to be a sedative. It attracted the favorable notice of the eminent Haller. In 1764, Bard is awarded the annual medal by Hope, the professor of botany, for the best student's collection of dried plants. Upon his graduation, in the spring of 1765, he tours Scotland, winters in London, and eventually reaches New York in the spring of 1766. In his father's house, he finds as a

dependent, his cousin and future wife, the beautiful Mary Bard, who, although impoverished by the unfortunate mania for speculation which ran in the Bard family, had rejected more than one suitor on his account. The character of this lovely lady shines out in all likenesses and letters that have been preserved of her. We read that "the remains of a calm and dignified beauty" were hers, even in advanced age. She was a thoroughbred of true colonial type and to her serene fortitude and devotion Bard owed his subsequent professional success. His Edinburgh education had cost his father £1000, and unfortunate speculations in agriculture, mining and paper manufacture on the glebe farm had further involved the parent in debt. Before marrying and settling down, Samuel Bard immediately set up in practice with his father to discharge this obligation. Within three year's time this was accomplished, the joint fees of the partnership being nigh £1500. In 1768, the young couple set up housekeeping on a nest egg of £100, the husband "wisely calculating that his wife's economy would double his income." In the same year, the new medical school was established and united to King's College, the chair of theory and practice of physic being assigned to Bard (act. 28). His coadjutors were, in the chair of anatomy, Samuel Clossy, an Irish Tory, author of a treatise on morbid anatomy (1763); in surgery, John Jones, afterwards an able medical officer in the Revolution, who wrote our first American medical book (On Wounds and Fractures, 1775); in physiology and pathology, Peter Middleton, a Scotchman, author (in 1769) of our first history of medicine (a dull production); in chemistry and materia, James Smith, brother of Chief Justice William Smith, the historian of New York; in midwifery, John V. B. Tennent, of New Jersey, a learned member of the Royal Society. All in all, a faculty of some distinction. At the first graduating ceremonies (May 16, 1769), Bard delivered a memorable "Discourse on the Duties of a Physician," our first tract on medical ethics, containing a plea for the establishment of a public hospital so eloquent, that Sir Henry Moore, the provincial governor, immediately headed the subscription list with £200. The building, erected on "three acres of lofty ground in the upper part of the city," was destroyed by accidental fire before completion

and, by reason of exhausted funds and political squabbles, was not re-erected until 1791. Meanwhile, the Revolution upset the fortunes of the Bards, who were, like many substantial people of the time, suspected of being Tories at heart, albeit with one son and brother in the Continental Army, and the father's residence (Hyde Park) within the American lines. At Hyde Park, in 1775, Dr. Bard placed his wife and five children, and continued practice in the city, removing however, when Sir William Howe took possession, to Shrewsbury, N. J., where, with the unfortunate tendency of his family, he soon exhausted his capital by attempting to manufacture salt from sea water. Reduced to poverty in a year's time, he returned to New York to find his house occupied by hostile hands and himself an object of suspicion. In these dire straits, he was relieved by Mr. Matthews, the mayor of the city, and thus regained his practice. His professional reputation at this time is evidenced by the fact that, after the peace, Washington selected him as family physician. Meanwhile, all of his family were stricken with malignant scarlatina, four of his six children died, his wife fell into deep melancholia, and Bard gave up his practice for a year, to restore her to health. The family letters of this period are pathetic. In 1784, the discontinued King's College was rechartered by Congress as Columbia College, of which Bard became a trustee in 1787. In 1791, the Medical Department was reorganized, with Bard as Dean and physician to the hospital, where, for the first time in our history, like Jacobi and Osler after him, he taught bedside medicine to students in the wards. Meanwhile, his dream of retirement to Hyde Park was shattered by the loss of his entire fortune (£1500) in an unlucky English investment, and it was not until 1798, that he gave up his New York practice, having arranged for this step by taking David Hosack into partnership in 1795. Even so, he continued practice about the countryside, and returning to the city to fight an epidemic, caught the fever. In this experience, he all but lost his life, of which the remaining twenty-three years were spent in country practice, experimental farming, gardening, farriery, sheep-raising, writing a Shepperd's Guide, a book on midwifery (1807), which passed through three editions, reading Goldsmith and Shakespeare, entertaining company and educating his grandchildren.

He was elected president of the Dutchess County Medical Society in 1798, an associate fellow of the College of Physicians of Philadelphia in 1811, and received the degree of Doctor of Laws from Princeton in 1816. Vigorous in mind and body to the last, he contracted a "pleuritic affection," along with his wife, whom he continued to nurse in her last illness, and died on May 25, 1821, surviving his faithful companion only twenty-four hours. Their mutual wish had been that they might leave the world together.

The writings of Bard are few in number, but his literary style, a part of his French heritage, and partly due to his classical training under Leonard Cutting at King's College, is an index of his character, of the utmost precision and simplicity. The essay on angina suffocativa (1771), his finest production, is signalized by Jacobi as our best colonial tract on diphtheria, "wise and accurate," "classical and simple." It was translated by Bretonneau and inserted in the appendices of his great monograph on diphtheritis (1826). Bard's early Edinburgh letters abound in interesting pictures of this great medical center, which was then outpacing Leyden. Here, for instance, is an evening at the house of Cullen, that lucid spirit who was very like Osler in his way with medical students:

"We are convened at his own house, once or twice a week, where, after lecturing for one hour, we spend another in an easy conversation upon the subject of the last evening lecture, and every one is encouraged to make his remarks or objections with the greatest freedom. I cannot help comparing him upon these occasions, to some one of the ancient philosophers, surrounded by his admiring pupils. It must make him very happy, to see so many, even from the wilds of America, crowding his lectures and listening to him with the greatest attention and pleasure; for he never speaks but you may see these emotions painted strongly in the faces of his hearers."

In the current superficial view of things, the mere personality of the individual is more important than the subject he deals with; nay, it is even believed by such bad actors in the human comedy that even great and difficult subjects can be compassed by rhetoric and the exploitation of personality. At the beginning of his discourse on the duties of a physician (1769), Bard tells his students that the doctor who does not devote incessant

study and care to preserving the lives of his patients is legally "accessory to murder," in other words, that the disease and the patient are more important than the doctor. He advises those who cannot see this to "consider the sixth commandment" and get out of the profession. As to hide-bound submission to the authority of the past he says:

"Read the writings of the wisest among the ancients, and they are filled with modesty and diffidence, why then should we ascribe to them infallibility and omniscience? They doubted the assertions and controverted the opinions of the times which preceded them; why should we not doubt and contravert theirs; and leave to posterity the liberty of contraverting ours?"

The rest of the discourse is devoted to the assassins of reputations, the exploiters of secret panaceas and patented nostrums, those who see something funny in sickness, suffering and sorrow, the writers of expensive prescriptions (at that time a prominent source of the doctor's income), and the need of a public hospital, one advantage of which would be the opportunity to study the effect of locality, climate, race and occupation upon disease. The discourse is a classic and deserves reprinting.

In 1788, the civil and military forces of New York were occupied for two days with a riot known as the "Doctor's Mob," incited by a current popular suspicion that the physicians were grave-robbers. When the mob approached Bard's house with curses, he ordered the doors and windows to be thrown open, and like Mark Twain's Mississippian, faced the rioters in the hallway. True to type, the crowd slunk away, verifying Tarde's theorem that "the collective intelligence of a mob is less than that of any one of its members." Real physicians were ever "conservative as kings." With personal courage of this kind went an extraordinary tenderness and solicitude for impoverished patients, friends, wife and children, of whom only three out of the usual colonial eleven lived. The face in the McClelland engraving is rugged, sombre, melancholy, not prepossessing; but the letters reveal the valiant, upstanding figure of a man who feared not his audit, and in whose career there was no abrupt transition from the honest gentleman he was to the great honor to his state and country which he came to be.

F. H. Garrison

THE INDICATIONS FOR SURGICAL PROCEDURE IN HEART DISEASE

(Delivered before the New York Academy of Medicine, April 2, 1925.)

SAMUEL A. LEVINE

BOSTON

To anyone who has seen large numbers of patients suffering from various kinds of heart disease, it is apparent that there are certain insurmountable obstacles that render treatment either difficult or hopeless. This situation becomes apparent only when such hearts are examined in the post-mortem room. It is obvious that medication or any other means ordinarily at our disposal cannot hope to remove a thrombus that completely occludes a large coronary artery which markedly diminishes the nourishment of an appreciable part of one of the ventricles. It is likewise obvious that therapy must prove unavailing when valves are so contracted or deformed that blood must flow from one chamber of the heart to another with the most extreme embarrassment, and then only in insufficient amounts. Numerous hearts are seen at autopsy in which the above findings exist, and which, therefore, make one seek for other means of therapy than those commonly employed.

The rapid development of surgery has enabled us to attack morbid processes involving almost every organ of the body except the heart. This organ, because of its mobility and vascularity and because of its absolute importance in maintaining life, has remained a stumbling block in the path of further progress, although it has long since been suggested that stenosis of the mitral valve in human practice might prove to be a condition that the surgeon could attack successfully. It has also been long known to investigators in the experimental laboratory that the mammalian heart could withstand considerable trauma and extensive surgical manipulation. Furthermore, asystole of an appreciable length of time has been observed with recovery of the heart. In 1916, while studying the effect of drugs on the cat's heart, I once observed the heart to stop, and although there

was no spontaneous contraction for almost twenty minutes, by maintaining artificial respiration and interrupted massage of the heart, thereby effecting some movement of the blood stream to the cerebral centers, and so preventing thromboses, the heart finally took on its beat and the animal completely recovered. It was with this background that Dr. Cutler and I, in 1920, and later with the helpful aid of Dr. Beck, started the investigation in the Surgical Laboratory of the Harvard Medical School and in the wards of the Peter Bent Brigham Hospital that led to the operative treatment for mitral stenosis. This lesion was particularly studied, although it was quite obvious that rarer congenital lesions like patent ductus arteriosus might prove fruitful fields for similar surgical treatment.

At the outset, in considering the possible surgical treatment of valve disease of the heart, the relative importance of mechanical embarrassment to the circulation as a result of valve defects on the one hand and weakening of the heart muscle on the other must be carefully appraised. There are some who teach that the role the valves play is insignificant. A generation ago, the importance of heart leaks and heart murmurs was over-emphasized. It seemed to us that in recent years the pendulum has swung too far in the opposite direction, for some authorities now maintain that the valves are of no improtance and everything depends on the muscle of the heart. It is inconceivable, when valves are narrowed to slit-like openings that anything but disaster can follow, no matter how healthy the heart muscle may be. In well-marked cases of mitral stenosis the left auricle becomes dilated and the wall grows thin. The pressure in the pulmonary circulation rises and the right ventricle frequently reflects the embarrassed state of affairs by developing hypertrophy and dilatation. These phenomena must indicate results of mechanical forces and cannot be interpreted as mere accidental incidents or as sequellae of selective pathological changes. It is otherwise difficult to concieve, for example, that rheumatic fever should dilate the left auricle when it involves the mitral valve and not when it injures the aortic valves. It is more reasonable to explain the change in the left auricle and in the right side of the heart as a direct result of the mechanical narrowing of the mitral

valve. In addition, it is not unlikely that the mechanical strain on certain parts of the heart, following mitral stenosis, in itself, exercises a deleterious effect upon the heart muscle, which is added to the original injury of the musculature produced by the virus of rheumatic fever. In other words, may not some of the heart muscle damage be independent of the rheumatic infection and merely the result of the distorted mechanism of the circulation? If the above is true, enlarging the auriculo-ventricular orifice ought to prove helpful, notwithstanding the fact that an increased insufficiency of the valve may thereby result, for it is quite well known that mitral incompetency is much less serious than mitral constriction.

In discussing the question of proper selection of patients for operation, it must be immediately appreciated that we are treading upon new ground. Past experience is practically nil. We, therefore, have merely our clinical judgment to rely upon. In the first place, it now becomes imperative that the exact anatomical disease of the particular valve involved must be accurate. Whereas in the past, in the treatment of heart failure, it did not matter materially whether a patient had mitral stenosis or aortic stenosis, or both, for the general heart failure was treated independently of the specific valve disease, it now becomes a matter of tremendous importance.

The proper diagnosis of mitral stenosis can be arrived at only after a complete study of the patient. The previous history of rheumatic fever or chorea is of great importance. Even the family history of rheumatic affections and the past history of repeated unexplained epistaxis, help one to properly appraise the type of individual with which we are dealing. It would not be helpful for this discussion to go into the signs and symptoms of heart failure, as they are general manifestations of circulatory embarrassment and do not sufficiently aid in anatomical diagnosis. Likewise it is not necessary to go into all the physical signs of mitral stenosis such as the color of the lips and cheeks, the small pulse, etc., as they again are not absolutely characteristic enough, although they do help somewhat in making up the entire picture of the disease.

The most important points in the diagnosis are obtained by auscultation of the heart. The signs of mitral stenosis vary considerably with the degree and extent of the injury. Very early in the development of this lesion, the first heart sound as heard at the apex becomes accentuated. At this time there may be no murmur at all in diastole but one only brought out by effort. As the stenosis becomes more advanced, a rumble may be detected at the apex occurring at rest, during mid-diastole or pre-systole. With increasing contraction of the valve complete diastole gradually becomes filled with a rumbling murmur. From experience I have come to the point of view that the presence or absence of a thrill, in general is not helpful, for it is not sufficiently critical. In hyperthyroidism, for example, we frequently find an apical thrill difficult to time accurately, as well as some of the other signs of mitral stenosis such as an accentuated first sound and auricular fibrillation. For some years, while the constriction of the mitral valve is going on, the heart remains regular; but in many instances, auricular fibrillation finally develops. When this occurs the rhythm becomes grossly irregular and the character of the diastolic murmur may change. The presystolic element is apt to disappear and there remains a mid-diastolic murmur of a longer or shorter duration. On rare occasions there may be marked constriction of the mitral valve with auricular fibrillation, yet without any or much of a murmur in diastole.

Another distinctly helpful evidence of mitral stenosis is obtained by X-ray. A prominence in the region of the left aurical as seen in the antero-posterior view or in an oblique view of the heart has proved of considerable value, for prominent dilatation of the left auricle is rarely seen in other conditions. Finally, there are electrocardiographic findings of extreme value in the aid of mitral stenosis. When we find prominent flat-topped and notched P waves (auricular complex) especially in conjunction with evidence of right ventricular preponderance, we have a sign that is almost pathognomonic of mitral stenosis. The only difficulty in the above diagnostic points is that none of them so far have ruled out the possible concommitant lesion of tricuspid stenosis, as all such findings may be present where both mitral and tricuspid stenosis exist at the same time. This differential

diagnosis is at present difficult and probably will remain so for sometime to come. Fortunately, tricuspid stenosis without mitral stenosis is exceedingly rare, and therefore it will be unlikely that following the above criteria a patient without mitral stenosis will be selected.

Not only must we be certain that the patient has mitral stenosis and that in addition there is not some other damaged valve that is equally embarrassing to the circulation, but we should carefully appraise the health of the musculature. We frequently see rheumatic heart disease at autopsy in which the ventricular musculature seems to be quite sound. In others, we find evidence of acute or chronic inflammation. In this connection there are several points that helps us to select the one from the other. In general, the smaller the heart the better the health of the muscle. When auricular fibrillation has developed in a rheumatic heart patient, it generally indicates a more advanced stage in the process. Electrocardiograms throw some light on the state of health of the ventricular musculature. The initial phase of the ventricular complex (Q–R–S waves) when sharp and of fair amplitude, are favorable indications: likewise upright T waves in Leads 1 and 2, in general, mean a healthier heart than when these waves are flat or inverted. The vital capacity of the lungs, which is a fairly satisfactory indirect measure of cardiac reserve, should be calculated and the closer this determination approaches normal, the more favorable the outlook. On direct examination of the heart, the quality of the first heart sound is of some importance. It is well known that the first sound is accentuated in mitral stenosis. It remains so until there is a weakening of the ventricular musculature when it may become muffled. It therefore is better to find a patient with a good first sound as heard at the apex. These considerations will aid in selecting those patients who have a fairly healthy musculature.

Inasmuch as the operation merely hopes to enlarge the mechanical constriction, only those patients with a fair degree or an extreme constriction of the valve can be possible subjects for the operation. The length of the diastolic rumbling murmur at the apex gives us some idea as to the degree of stenosis. In the

early stages only a short presystolic or mid-diastolic murmur can be heard, but as the narrowing increases, diastole may become completely filled with this murmur. Dilatation of the left auricle as seen by roentgenograms also in a measure reflects the mechanical constriction that is taking place in the mitral valve. One should, therefore, select those patients in whom it seems likely that the contraction of the valve is extensive.

Lastly, there is still another factor to be considered in the selection of appropriate patients for surgery of the heart. We are all aware that rheumatic infections are very apt to recur interruptedly over many years. It has been my experience that repeated infections have taken place even when the patient was able to carry out all the hygienic and prophylactic directions we gave him. Tonsillectomy and removal of other foci of infection have not prevented recurrences. It therefore is important to select those patients who have passed the age when further rheumatic infections are most apt to recur. In general, as a patient grows older, the infectious element is apt to diminish and the problem becomes more and more a matter of the circulation. We therefore should prefer to have patients past puberty and preferably over twenty years of age. There are some patients, who having had one or two attacks of rheumatic fever or chorea, thereafter remain entirely free from recurrence of infection for many years and only show signs of increasing symptoms of developing valve disease. It is likewise favorable in this connection to find a long period of freedom from infections before surgery is contemplated.

In recapitulation, one might say that there are heart conditions in which the mcehanical defect is an important factor in producing the symptoms of heart disease. It is hopeful that in the future some of these abnormalities might be treated surgically. Inasmuch as mitral stenosis is the most common of such conditions, operations have been proposed and performed with the view of improving the circulation. In the selection of the above patients for this operation, the anatomical diagnosis must be exact. There should be no other valve lesion and the stenosis of the valve should be considerable. The heart muscle should be in fair health and the patient preferably should be beyond the

age in which repeated rheumatic infections are most likely to occur. Following the above criteria it is hoped that the operative mortality will diminish in time and that properly selected heart patients will, in the future, derive benefit from surgery.

THE SURGICAL RELIEF OF CARDIAC PAIN

(Delivered before the New York Academy of Medicine, April 2, 1925.)

WILDER PENFIELD

The operation of cervical sympathectomy has in the past been used to treat glaucoma, exopthalmic goitre, migraine and other maladies. We have consigned such treatment of these conditions to that large and ever growing heap of discarded remedies. Those of us who are using this operation in the treatment of angina are in danger of seeing this treatment also go into scornful discard, unless we are guided in our application of the remedy by a reasonable rationale. I am not qualified to judge of the effect of these operations upon heart action. Those cases upon which I have operated at the Presbyterian Hospital have been studied from this point of view by Dr. Robert Levy. The two cases to be reported tonight throw new light upon the nervous mechanism involved and make possible what would seem a more satisfactory explanation of the nervous processes involved in angina pectoris.

The sympathetic nervous system has three direct connections with the cardiac plexus, the superior, middle and inferior cardiac nerves. All carry motor impulses to this plexus. The superior cardiac nerve probably carries most or all of the constrictor fibers to the coronary vessels and aorta, as urged by Ransom (7). The middle and inferior cardiac nerves are called by Langley (9) the minor and major accelerators of the heart. Although all three nerves carry motor fibers, only the lower two contain sensory fibers from cardiac plexus to sympathetic ganglia. These afferent impulses reach the central nervous system through the white rami to the upper six thoracic spinal segments. Afferent fibers also pass up the vagus.

Thus the rationale (or lack of it) for the various operations performed appears evident. Jonnesco (8) removed the lower part or all of the chain in order to eliminate all afferent paths through the sympathetic. Hoffer (6) cut a branch of the vagus which he believed to be the depressor, to eliminate vagus afferents, and Coffey and Brown (1) removed the superior sympathetic ganglion because it was easily accessible. Ransom has suggested that this last operation may prevent reflex spasm in the coronaries and aorta.

As I shall take up the following cases only from a neurological point of view, it is sufficient to say that the first patient, G. C., had a syphilitic aortitis with aortic insufficiency. The angina pectoris was severe and completely incapacitating. It began in the manubrium and spread to the inner aspect of the left arm. If not checked by nitroglycerine it then spread to the inner aspect of the right arm.

According to the theory of referred pain as first suggested by Head (5) and Mackenzie (11) a stimulus passes from the heart via the sympathetic to a posterior root ganglion. Here in some way the sympathetic impulse is supposedly turned into stimulation of certain spinal ganglion cells which cause the patient to feel pain. This pain he refers to the sensory distribution of the nerve root in question.

According to this theory, it should have been sufficient to remove the middle and inferior cervical and stellate ganglia on both sides. This of course interrupts all sympathetic connection between cardiac plexus and central nervous system. Consequently, this operation was performed on both sides leaving in place both superior cervical ganglia. It is evident that each superior sympathetic ganglion is now isolated. Its only connection with the spinal cord which had been by means of the sympathetic chain is now removed. It is provided only with efferent outlets to the vessels of the brain, the outgoing branches of the fifth nerve, the peripheral distribution of the highest three or four cervical spinal nerves and the cardiac plexus. It cannot be the path for sensory conduction—first, because there are apparently no sensory fibers in the superior cardiac and secondly because the ganglion now has no known connection with the central nervous system.

Nevertheless, on the ninth day after operation the patient sent for the interne on the ward because of pain in his head and the following is Dr. Samuel Lambert's careful note made at the time: "The patient was sitting straight up in bed. His forehead was moist with perspiration equally on both sides. The rest of his body was warm but not moist. He was perfectly clear mentally. He said he had a dull pain which started all around his neck, just below his jaw, like a collar. It went up into his gums and then up the sides of his head to the top. At the same time he had a feeling of tightness in exactly the same locations. He had no pain or feeling of constriction any other place. His blood pressure was over 300 systolic and 0 diastolic. He felt a little nauseated momentarily.

"He was given 0.0006 gms. nitroglycerine. After five minutes he said the pain had entirely left. In the patient's words, 'It just kind of floated away.' His blood pressure was still over 300 systolic and 0 diastolic.

"Fifteen minutes later he said he had a very slight pain returning in his lower jaw. Blood pressure still over 300 and 0. No perspiration on forehead. Pulse throughout 82–86.

"One half hour later he was given a second dose of nitroglycerine. Pain completely gone. Blood pressure 170 systolic and 0 diastolic."

It is now a little over a year since the operation and although he was restored to activity again, he has continued to have attacks of angina pectoris in the face, head and sometimes neck. These attacks are easily relieved by nitroglycerine.

It is impossible to explain these seizures on the basis of referred pain. The angina which the patient experienced was in the distribution of the fibers of the superior sympathetic ganglion which accompany the branches of the fifth nerve and upper three cervical nerves, but this ganglion is cut off from the central nervous system. Therefore, I have assumed that the ganglion is stimulated by a reflex in the autonomic system. Elsewhere in the sympathetic system axone reflexes (10) have been clearly recognized and Gaskell has stated that by analogy he should expect the vagus to enter into such reflexes (4). Axones in the vagus may carry the impulse by connectors through the

rich anastomosis to the ganglion. The motor cells of the ganglion discharge and cause spasm of the smooth muscle in the vessels and sweat glands which they innervate. This peripheral spasm is then appreciated as the pain of angina through the pathway of the cerebro-spinal nerves. Instead of the pain being referred it is actually felt in the periphery. As was mentioned above nitroglycerine which relaxes smooth muscle, stopped the pain, sweating soon ceased and the blood pressure came down.

The second patient to be described, S. A., aged 38, had a general arterio-sclerosis and hypertension, his blood pressure averaging about 210–105. Walking across the ward was sufficient exertion to precipitate a severe attack of angina pectoris, felt as pressure in the precordium and left arm.

I removed the left cervical sympathetic chain, including all the cervical ganglia and the stellate ganglion, on the advice of Dr. Levy. When the patient became active after the operation, typical attacks of angina pectoris reappeared. But now it was on the right side and the sweating which accompanied it was on the right side of the face and right arm. Some pressure was felt in the upper sternum, right side of the neck and inner aspect of the right arm. These attacks continued and he was again operated upon. This time, because of the good results reported by Coffey and Brown, the simple operation of removing the superior sympathetic ganglion was performed. On the third day after removal of the right superior ganglion, angina recurred. Now the pain appeared to be in the right arm, the right neck being left out, and sweating now, during attacks, was altogether absent in the face but appeared in the right arm and chest.

Thus, a second time we see that the angina was felt in the area where the sympathetic motor supply was intact. After the second operation the patient's systolic pressure fell from an average of 210 to 170. It rose, however, as was the case with the first patient during attacks (reaching 205). Recovery from the immediate effects of the operation was satisfactory but on the eighth day after operation the patient suddenly had what Dr. Levy felt to be a coronary occlusion, and he died on the sixteenth day.

On the theory of an axone reflex, the conditions are exactly the same as those in which these reflexes occur elsewhere in the sympathetic nervous system. By stimulation of sympathetic axones in the cardiac plexus, the motor cells in the sympathetic ganglia would be excited causing localized sweating, arterial spasm and some increase in blood pressure.

On the above basis certain phenomena of angina are easily explained. Mackenzie (12), when investigating the pilomotor (or goose-skin) reflex, found that rubbing lightly the skin under the left breast caused the goose-skin to pass up the left side of the chest and down the inner aspect of the left arm. This sympathetic reflex induced a chilly sensation in the same distribution. When he tried the reflex on a case of angina, the patient remarked in surprise that the chilliness corresponded with the usual distribution of his pain. This pilomotor reflex is due to a sympathetic motor discharge and the resultant sensation of chilliness is reported to the consciousness by way of the sensory spinal nerves. The mechanism is the same as has been suggested above for angina and the resulting sensation has the same peripheral distribution.

The hyperaesthesia which may follow a seizure would indicate that the pain was due to a peripheral condition just as any severe pain from a peripheral cause may leave a hyperaesthesia of the skin. Patients at times complain that pressure on some area of skin which may be quite small and well localized induces a bout of angina. Such pressure might perhaps set up smooth muscle contraction in an area already receiving subliminal stimulation.

That an angio-spasm originating in the stellate ganglion may be the cause of the pain in angina was suggested by Brünning (2) for the following reasons: (1) In handling the ganglion preparatory to removing it he observed that his patient's left arm became suddenly blue as in Raynaud's disease; (2) The fact that blood pressure rises during attacks.

The new hypothesis proposed for the explanation of the nervous mechanism in angina pectoris depends upon an autonomic axone reflex. It might well be called, therefore, reflex pain. It causes peripheral spasm of smooth muscle and thus may re-

semble the pain in various angiospastic conditions. It differs from the referred pain of head principally in that the point of contact of sympathetic and cerebrospinal system is shifted from the posterior root to the periphery where there are other analogous contacts between the two. No attempt has been made here to expand the hypothesis to other types of visceral pain nor to analyze different kinds of cardiac pain.

Finally certain practical conclusions may be drawn:

1. The removal of a sympathetic ganglion removes the possibility of angina pectoris in the *motor* distribution of that ganglion only.

2. Pain is still possible in the motor distribution of the remaining ganglia, provided the stimulus arising in the heart or aorta is adequate.

3. Success in the operation depends not upon interrupting a direct afferent path from cardiac plexus to central nervous system as has been assumed, but upon the interruption of autonomic reflexes.

4. Complete cervico-upper-thoracic sympathectomy should only be employed in cases where life is really insupportable even under the best medical care. In certain less severe cases it is possible that removal of the superior sympathetic ganglion may be of benefit because of the resulting effect upon the irritative focus in the heart or aorta.

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THE APPLICATION OF SURGERY IN THE TREATMENT OF MITRAL STENOSIS

(Delivered before the New York Academy of Medicine, April 2, 1925.)

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I. Introduction

For the privilege of addressing the Academy of Medicine of New York City I am very grateful. I should like to express my gratitude for this privilege to Dr. Elliott C. Cutler, Professor of Surgery at the Western Reserve Medical School. With the collaboration of Dr. S. A. Levine the application of surgical methods in the treatment of mitral stenosis was carried out at the Peter Bent Brigham Hospital and the Laboratory of Surgical Research of the Harvard Medical School. We are continuing studies in the subject at the Western Reserve Medical School. To our teachers, Dr. Harvey Cushing and Dr. Henry Christian, we take pleasure in expressing acknowledgment and indebtedness.

II. Rationale of the Procedure

The fundamental idea upon which this work is based is that if the mitral obstruction be decreased the mechanics of the cir-

culation become more compatible with life, notwithstanding the accompanying regurgitation which is thereby increased. In support of this idea is the fact that clinically mitral insufficiency is better tolerated than mitral stenosis. In mitral stenosis the dyspnoea, weakness, and incapacity are most distressing, and the condition is usually fatal before the age of forty. In mitral insufficiency, on the other hand, the adaptation of the heart may be such that there is little incapacity. These clinical facts are supported by laboratory evidence. When a mitral stenosis is replaced experimentally by a mitral insufficiency there is a striking improvement in the left auricular and ventricular pressures. Such evidence seems to be justification for carrying out the procedure in human cases, although the adaptation of the heart to the sudden change in the mechanics is a problem not yet definitely settled.

If surgery is to be applied in the treatment of mitral stenosis, the correct diagnosis of cardiac conditions, heretofore largely a matter of academic interest, becomes a matter of vital importance. The most suitable cases of mitral stenosis for surgical intervention are those in which attacks of rheumatic fever are not prone to recur and those in which the myocardium is in relatively good condition.

III. Historical

The history of cardiac surgery begins with discussion of wounds. In the earliest records they were considered as absolutely and necessarily fatal, and it was not until September, 1895, that Cappelen of Christiania, placed the first suture in the human heart. A surgical procedure was thereby introduced that has decreased the mortality of wounds of the heart by about forty per cent.

The successful suture of a wound of the heart to-day is not an uncommon surgical feat, but aside from this operation little progress in cardiac surgery has been made during the last thirty years. This is unfortunate because there may exist conditions in the heart for which surgery alone may be the only effectual treatment. Only two attempts to relieve intracardiac obstruction were recorded. An attempt to stretch a stenosed aortic

valve by introducing a finger into the stenosed ring through the invaginated wall of the aorta was carried out by Tuffier in 1912. The other was by Doyen who attempted to section the stenosed mitral valve, but death was due to a lesion made in the interventricular septum.

Early in this century the thought was entertained by Samways, Lane, and Brunton that mitral stenosis might be relieved by notching the obstructing orifice and the wish was expressed that this might be done as easily at operation as at the necropsy table. The proposal provoked a storm of criticism. It was claimed by some that rheumatic heart disease was essentially a disease of heart muscle and that the valvular element was of secondary importance. This may be true in certain cases, but there are undoubtedly cases of mitral stenosis in which the mechanical obstruction is the dominant feature and in which the myocardium is relatively intact. But chiefly the technical difficulties besetting the proposal were enumerated as making its successful accomplishment impossible. Time does not permit me to relate the various experimental contributions that have been made by many investigators and that have been of great value to us.

IV. Experimental: The Surgery of the Mitral Valve

A. *Method*

The desirability of carrying out the operative procedure on the mitral valve under direct vision is apparent. Any important surgical step taken in the dark is beset with danger. An effort was, therefore, made to develop a technique which could be carried out under direct vision. The work of other investigators who have taken up this problem has been accompanied with little success. To clamp off the base of the heart, to lay open the ventricle, then to incise the mitral valve, and finally suture the wound in the ventricle was an ordeal that neither the heart nor the brain could tolerate. It was found experimentally that the heart and the brain could tolerate ischemia for a limited period of time. This period of safety in the dog was one and one half minutes; in the cat, three minutes; and in the rabbit, three and three quarter minutes; and if the obstruction was continued be-

yond these limited periods, either the heart failed to recover its normal rhythm, or signs of degeneration of the cortical cells developed subsequently. In the human the heart, undoubtedly, can tolerate this procedure better than in the lower animals, but under the most favorable circumstances the time that could be taken would be insufficient to carry out the procedure with any degree of equanimity. The flow of blood through the heart, therefore, cannot be interrupted during the procedure. This limitation of method necessitates adequate instruments to be inserted into the cavity of the heart to cut the mitral valve.

The brilliant results afforded by cystoscopy suggested naturally the application of a similar visual method to the heart and our first investigations centered upon this subject. The urologist is well aware of the handicap of a cloudy fluid medium and, of course, in the opaque medium of blood the light in the cystoscope is completely deadened. With modifications of the visual apparatus, however, a more or less imperfect degree of vision can be obtained in the heart. The lamp should not come into contact with the blood. The objective should be a plano-convex lens of short focus.* When direct contact with the lens is established, valve leaflets, chordae tendineae, and endocardium can be recognized. It was felt, however, that the results of cardioscopy were too imperfect to justify the added complexity of the procedure which it entailed.

The approach to the mitral valve lies either through the ventricle or through the auricle. There is some difference of opinion as to which is the more satisfactory. We have selected the ventricular rather than the auricular approach because the ventricle is more accessible at operation than the auricle, there is less likelihood of the wound in the ventricle to tear, and because there are sometimes present in the auricle blood clots which might be dislodged at operation.

B. *Instruments.* 1. *Tenotome Knives*

When the work was first taken up it was felt that the stenosed mitral valve could be sectioned satisfactorily by a semi-curved

* A seat to contain the lamp should be ground in the lens to avoid reflection of light.

tenotome knife possessing a long slender shaft inserted through the left ventricle. By a series of experiments on dogs and cats a simple operative technique was established. The heart was steadied by a suture placed in the apex of the left ventricle. With the knife inserted through the ventricle the valve leaflets could be felt, a cut of variable size could be made, and a corresponding degree of mitral insufficiency could be produced. The ease with which this could be done experimentally seemed to justify the application of the method to human cases. In the first case in which this method was used, the mitral obstruction seemed to be partially relieved at operation; this was indicated by a change in the heart sounds, an increase in the systolic murmur, and by an improvement in the general health of the patient. In the second and third cases in which the same method was used, the relief of the obstruction, as shown by the post mortem examination of the heart, was definite but slight, and demonstrated the inadequacy of the simple knife in cutting the stenosed mitral valve to such an extent as to enlarge sufficiently the opening.

2. *A Cardiovalvulotome*

A consideration of the character of the tissue to be incised emphasizes the importance of certain mechanical principles, the application of which are essential to the successful relief of the mitral obstruction. The stenosed mitral valve often takes on an extraordinary thickness and deformity. Scarification adds to the toughness of the structure, and deposits of calcium give it a rigid and brittle consistency. When the condition of stenotic valves is considered, the degree of obstruction, the thickness of the valve, its fibrous and often calcareous condition, it is apparent that such a valve, if valve it may be called, cannot be sectioned satisfactorily by a force applied to a knife several inches from the cutting edge, without the aid of counter-pressure applied to the valve at the point where the section is to be performed. It seems, furthermore, that a slit-like cut in the markedly thickened valve, on account of the stiffness and the rigidity of the incised margins, may relieve the functional obstruction but little and that the excision of a piece from such a

valve is almost a necessity if the obstruction is to be relieved. It seems essential, therefore, that a powerful cutting device should be employed that will actually excise a piece from the stenosed ring and remove the piece from the blood stream. For the accomplishment of this aim a cardiovalvulotome was devised.

The cardiovalvulotome consists of two close-curved, shearing edges which, by telescoping the handle, approximate each other and accurately override, so that the tissue lying between the cutting edges is excised and encased in the instrument. As the force applied to the handle is released, the cutting edges move apart by virtue of a spring concealed in the handle. The cutting edges are related as the blades of a shear, and this contributes to make the instrument a powerful cutting device.

The operative procedure was worked out in the laboratory. The heart is exposed. A suture placed in the apex provides for traction and handling of the heart. A region devoid of coronary vessels, as near the apex as possible, and away from the base of the anterior papillary muscle is selected for the introduction of the cardiovalvulotome. Two sutures of silk taking a deep bite of muscle are placed in the area selected for the insertion of the instrument so that the four threads represent on the surface of the heart a square of one centimeter. These are the control sutures and they are of importance in the control of hemorrhage. An incision is made between the sutures and the cardiovalvulotome is inserted into the heart. The cutting edges are introduced into the mitral ring, the position being determined accurately by the index finger of the left hand as it feels the end of the instrument through the invaginated wall of the left auricle. The mitral valve leaflets now lie between the cutting edges and, by telescoping the handle, parts of one or more of them are excised and encased in the instrument which is then removed from the heart.

That this operative procedure is feasible upon dogs has been well demonstrated in the laboratory where in a series of thirty dogs twenty-four survived the operation, almost all of which were given a well marked mitral insufficiency. Of the six operative fatalities two occurred immediately after making the inci-

sion at the base of the anterior papillary* muscle preparatory to the insertion of the cardiovalvulotome, one was the result of hemorrhage, and three followed the creation of an excessive regurgitation due to the removal of too large a segment from the valve.

The cardiovalvulotome was used in the fourth and fifth human cases. In the fourth case a segment of the stenosed mitral valve was excised and removed from the blood stream. In the fifth case difficulty in orientation was encountered at operation. The mitral valve orifice could not be located by the tip of the instrument and the obstruction therefore was not relieved.

3. *A Cardioscopic Valvulotome* (Fig. 1)

The experience with the fifth human case emphasized the necessity of a more satisfactory method of orientation in the heart. A visual apparatus was, therefore, incorporated in the cardiovalvulotome. The line of vision was bent by a prism placed in the handle so that the eye is at a safe distance from the sterile field. Experimentation with this instrument is being carried out and it seems that we shall use it in the next human case.

V. The Disposition of the Pericardium

The handling of the pericardium is an important factor in cardiac surgery. It may be involved in two serious operative sequelae: (a), a rapidly forming pericardial effusion which may lead to fatal tamponade; (b), cardiopericardial adhesions which commonly follow the subsidence of the effusion. Compression of the heart by the collection of fluid in the pericardial cavity was the cause of death in our third human case operated upon for mitral stenosis. Serious tamponade occurred also in case one during the first three days after operation.

* The literature contains numerous references to the so-called vital areas of the heart and they appear to lie in the region of and immediately adjacent to the auriculoventricular ring. To these vital areas our experience adds the region at the base of the anterior papillary muscle and this represents the only area near the apex of the left ventricle that should be avoided.

It was shown experimentally that an increased pressure in the pericardial cavity was accompanied by a fall in the arterial pressure and a rise in the venous pressure, and that these phenomena were brought about by the obstruction to the filling of the heart produced by the increased intrapericardial pressure. When this reached the level of the venous pressure, the heart ceased to function. *As a precaution against tamponade an opening in the pericardium one or two centimeters in length should be provided in every operation upon the human heart.*

VI. Exposure of the Heart

The median sternotomy exposure is used. The skin incision extends from the level of the second or the third interspace to the midpoint between the umbilicus and the xiphoid. The xiphoid may be either removed or separated on one side from its ligaments and aponeuroses. The underlying structures are freed from the sternum and a spatula is inserted beneath it. The sternum is split longitudinally with a saw and transversely at the level of the second interspace, care being taken to avoid the internal mammary vessels. Each half of the sternum is retracted, and the pleurae are dissected laterally with a moist sponge. The pericardium is opened anteriorly and inferiorly and the diaphragm is divided about three or four inches. This latter manoeuvre is essential if a full exposure of the heart is to be obtained.

VII. Five Cases of Mitral Stenosis Treated by Surgical Methods

An attempt to relieve the mitral obstruction surgically was carried out in five cases. In each case the signs typical of mitral stenosis were presented. In each case the prognosis was distinctly bad.

The first case was a girl eleven years old. Dyspnoea on exertion was present for three years. For eight months previous to operation she was confined to bed and during this period she had alarming attacks of hemoptysis. At operation a tenotome knife was inserted through the left ventricle and an attempt was made to incise each cusp of the obstructing ring. The peri-

cardium was closed tightly without drainage. An effusion developed in the pericardial cavity during the first three days after operation producing heart tamponade and the condition was critical. With the absorption of the fluid, however, the condition improved. The patient is now living almost two years after operation. Hemoptysis has not recurred. She has gained about ten pounds. Signs of mitral stenosis persist, but the general condition has, undoubtedly, improved.

The second case was a woman thirty-five years old. Dyspnoea on exertion and precordial pain were present for four years, and these symptoms demanded frequent hospital care. Oedema of the legs, enlargement of the liver, and auricular fibrillation developed. At operation the left auricle was a huge, pulseless sac of blood. Three attempts were made to incise the stenosed mitral valve. After the third attempt the heart stopped momentarily, but almost immediately began at a rate of fifty. Ten hours after the operation death occurred from myocardial failure.

The third case was a man twenty-six years old. At operation extensive fibrous adhesions between the heart and the pericardium were sectioned. Two attempts with the tenotome knife were made to incise the calcareous mitral ring. The pericaridum was closed tightly without drainage. The procedure was well tolerated. During the postoperative course which lasted twenty hours the patient presented the picture of a failing circulation. At necropsy three hundred and fifty cubic centimeters of fluid were found in the pericardial cavity, the rapid formation of which undoubtedly produced a fatal tamponade.

The fourth case was a woman nineteen years old. Shortness of breath on exertion was present for fifteen months. Recently because of dyspnoea her work as an office clerk had to be discontinued. The operation of partial mitral valvulectomy was performed utilizing the cardiovalvulotome for the first time. A segment of the mitral valve was excised and removed from the blood stream by the cardiovalvulotome, and the incision in the ventricle was sutured without losing a drop of blood. During the first three days after operation the condition was apparently satisfactory. The blood pressure was at the preoperative level. The diastolic rumble present before operation had changed to a

presystolic murmur; the thrill had disappeared and a short systolic murmur was heard at the apex. Bilateral pneumonia developed, the heart dilated, and death occurred on the sixth day.

The fifth case was a woman twenty-one years old. The prognosis under medical treatment was distinctly bad. At operation two attempts were made to excise a segment from the mitral valve. Each was unsuccessful. The difficulty lay in locating the mitral orifice so that the distal portion of the cardiovalvulotome could be inserted through it. The patient recovered from the operation. Thirty hours later signs of pulmonary congestion appeared. The heart dilated. Death occurred on the third day. At necropsy consolidation of the lungs was found.

The cases warrant analysis in retrospect. In the second case auricular fibrillation and decompensation indicated advanced myocardial disease. Was not the myocardium too badly damaged to permit of any simple operative procedure? The third case carried with it one of the most fundamental lessons in cardiac surgery. Extensive cardiopericardial adhesions were sectioned at operation and the pericardium was closed without drainage. From these cut surfaces there was an exudate of serum which in twenty hours produced a fatal tamponade. A postoperative roentgenogram showed an increase of one centimeter in the transverse diameter of the cardiopericardial shadow and should have suggested to us the need of performing a pericardiotomy to relieve the pressure. In the fourth and fifth cases death was due to pulmonary congestion and pneumonia. That the opening made in the mitral valve in the fourth case was followed by too great a change in the mechanics of the circulation is a probability. In the fifth case, however, the mechanics of the circulation were not altered at operation. This patient preceding operation had several periods of fever which were supposed to have been due to pulmonary thrombosis and infarction. A hidden infection may have been a factor in the development of the postoperative pneumonia.

VIII. Summary

A mortality of eighty per cent. is not encouraging, but if this be a criterion, may it not be compared with the results obtained

in the development of the surgery of other parts of the body? As reported by Dr. Keen not one of the first twenty-eight gastrotomies (1875) recovered and as late as 1896 the mortality in pylorectomy was seventy-two per cent. In the development of the surgery of the brain the first ten cases operated upon by Dr. Cushing were either made worse or succombed.

From each of our cases a great deal has been learned. The simple knife was shown to be insufficient for the task. The cardiovalvulotome which we devised is an efficient cutting device. With it a segment can be actually excised from the mitral valve and the piece removed from the blood stream. To provide better orientation in the heart a visual apparatus has been added to the instrument. The danger of pericardial effusion developing after operation was emphasized and as a precaution against compression an opening in the pericardium of one or two centimeters should be provided in every operation upon the heart.

At present nothing that is definite can be stated concerning the beneficial effects that may result in mitral stenosis by relieving the mitral obstruction. Until the basic idea is shown to rest on faulty grounds further attempts should be made. There is some consolation in the facts that there were no operative deaths and that one of the patients is living almost two years after operation and seems to be somewhat improved.

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These are the main headings only. No attempt has been made to add cross references.

Accidents
Agriculture
Alcoholism
Anaesthetics
Anatomy
Animals—see:
  Medicine, Veterinary: Zoology
Anthropology
Anthropology. Criminal
Antiseptics
Autotherapy
Bacteriology
Bacteriotherapy—see:
  Bacteriology
Balneology & Balneotherapy—see:
  Hydrotherapy
Bibliography
Biography
Biology
Birth Control
Blind
Blood
Botany
Cancer
Charities
Chemistry. Agricultural
Chemistry
Chemistry. Physical
Chemistry. Physiological
Chemotherapy
Children
Chiropody
Chiropractic
Cholera (Asiatic)
Christian Science
Circulatory System—see:
  Blood; Heart
Climate
Colloids
Colonies
Conduct
Constitution
Contagion and Contagious Diseases
Corsets
Cremation
Criminals
Cripples
Dairies
Deaf-mutes
Deafness
Dementia Praecox
Dentistry
Dermatology
Development
Diagnosis
Diet—see:
  Food
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Drugs—see:
  Materia Medica, Pharmacy, Therapeutics
Ear—see
  Otology
Education
Education. Medical & Medical Schools
Education. Physical
Electricity—see:
  Electrotherapy
Electrotherapy
Embryology
Endocrinology—see:
  Organotherapy
Engineering. Sanitary
Epidemics
Epilepsy
Ethics. Medical

Ethnology
Eugenics
Evolution
Exercise
Eye
Fermentation
Food
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  Chiropody
Forestry
Fungi
Gastrointestinal Diseases—see:
  Digestive Organs
Genetics—see:
  Biology; Heredity
Genito-Urinary Organs
Geography
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  Organotherapy
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Gymnastics
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Health—see:
  Hygiene, Public
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Heating and Ventilation
Heredity
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Histology
History
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Hospitals. Social Service
Hydrology—see:
  Hydrotherapy
Hygiene. Industrial—see:
  Occupations
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Hygiene. Sexual
Hygiene. Social—see:
  Sociology
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  Insane
Immunity
Inebriety
Infants—see:
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  Contagion & Contagious Diseases
Insane
Insanity—see:
  Insane
Insects
Intestines—see:
  Digestive Organs
Jurisprudence. Medical
Laboratories
Laryngology
Leprosy
Libraries. Medical
Life Insurance
Lighting
Malaria
Malpractice
Massage
Materia Medica
Meat
Medicine
Medicine. Clinical—see:
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Medicine. Eclectic
Medicine. Experimental
Medicine. History . . .
Medicine. Legal—see:
  Jurisprudence. Medical
Medicine. Military
Medicine. Naval—see:
  Medicine. Military
Medicine. Popular
Medicine. State—see:
  Hygiene. Public

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Medicine. Veterinary
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Meteorology
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Milk
Missions & Missionaries. Medical
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Morphology
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Narcotics
Natural History
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Nervous System—see:
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Neurology
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Nursing
Nutrition—see:
Digestive Organs
Obstetrics
Occupations
Occupations. Hygiene of
Open Air
Ophthalmology—see:
Eye
Opium-habit
Optics—see:
Eye
Optometry
Organotherapy
Orthodontia—see:
Dentistry
Orthopaedia
Osteopathy
Otology
Parasites
Pathology
Pathology. Comparative
Pedagogy—see:
Education
Pediatrics—see:
Children
Pellagra
Pharmacy
Philanthropy
Phonetics
Photography
Phototherapy
Phrenology
Phtisis—see:
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Physics
Physiology
Physiology. Vegetable
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Plants—see:
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Psychology
Psychotherapy—see:
Psychology
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Radiotherapy
Radium—see:
Radiotherapy
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Proctology
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Wounded. First Aid. Medicine. Military
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Rhinology—see:
Nose

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Soldiers
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Throat—see:
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Toxicology—see:
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Tropical Medicine—see:
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Venereal Diseases
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Vivisection
Vocation—see:
Occupations
Voice
War—see:
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Hydrotherapy: Water. Supply of
Water. Supply of
Waters. Mineral—see:
Hydrotherapy
Women—see:
Gynaecology
Wounded. First Aid to
Yellow Fever
Zoology

ANNOUNCEMENT

The Committee on Publication is instructed to announce that the Academy does not hold itself responsible for the facts or opinions set forth in any of the papers contained in its printed transactions.

AMENDMENT TO PUBLIC HEALTH LAW IN RELATION TO CADAVERS

The Public Health Committee of the Academy has been interested for a number of years in increasing the number of autopsies performed in various hospitals and institutions in New York City and the rest of the State. A series of conferences have been held almost annually with the deans of the medical schools and professors of anatomy and medicine, but there have been frequent differences of opinion. The anatonomists feared that an increased number of autopsies might prevent an adequate supply of material being furnished the medical schools for dissection.

A general agreement was reached during the autumn of 1924 and an amendment to the law drafted by the Public Health Committee. A bill was introduced into the legislature at the request of the Academy and was enacted by the legislature and has become Chapter 369 of the Laws of 1925.

The amendment to the law provides that no corpse shall be delivered to any institution in case the next of kin within forty-eight hours after death notifies the institution that the body is desired for interment, nor shall a corpse be delivered to any institution if the patient has expressed a desire in his last illness that his body be interred.

The law further provides that the persons having control of any hospital or institution in which a patient has died may order the performance of an autopsy unless objection is made by the next of kin within forty-eight hours after death. In case of unclaimed bodies, the medical colleges, schools and universities have a priority claim to the cadavers for the purpose of teaching anatomy.

The law provides also that an institution receiving a body may, at its discretion, cause the body to be buried or cremated, or retain parts of it for scientific purposes.

Under the former law, no body could be delivered to the medical colleges or universities for autopsy within forty-eight hours after death, or if known to have friends or relatives without their assent.

The new law eliminates the possibility of assumed friends preventing an autopsy, and will relieve the institutions of the necessity of securing consent from the relatives or friends, and places the burden upon the relatives to prevent an autopsy if such is not desired.

CONTROL OF ACADEMY FINANCES

During a period of months the Trustees and the Council studied the financial sections of the By-Laws on account of the difficulty of living up to the old By-Laws in many matters of detail. Recommendations were finally made by the Council to the Academy and amendments to the By-Laws were introduced at a Stated Meeting of the Academy on March 5 which were adopted at the Stated Meeting on April 5.

The amendments to Article XV provide that the Trustees may make transfers from one fund to another. This power was formerly vested in the hands of the Fellows and it seemed impossible for the Trustees to remember always, when the library had sold triplicates to the amount of $25 or so, to have a special vote of the Fellows in order to transfer this amount of money to the general Library Fund. The amendment will also simplify the procedure in transferring other monies from one fund to another when it is necessary.

The changes now permit the Trustees to invest in such securities as are legal for the investment of trust funds in the State of New York, whereas formerly the investments were limited to Federal, New York State, and New York City bonds and first mortgages on New York City property.

The new By-Laws also permit the Trustees to borrow money without specific authority from the Fellows of the Academy.

In regard to the possible sale of premises of the Academy there is a change in the wording of this By-Law for the purposes of clarification only and to permit the use of monies received from the sale of the premises for equipment as well as for a new site and building.

The new By-Laws also provide for an Endowment Fund as the sole permanent fund of the Academy. This was made necessary on account of the abolition of the General Permanent Fund by the amendment to the act of incorporation adopted by the legislature in 1924.

Article XI of the By-Laws was modified so that checks may be signed by any two or more officers or members of the Board of Trustees instead of its being limited to the Chairman and Acting Chairman and the Treasurer.

The duties of the Treasurer provided for in Article VIII are largely carried out by the personnel of the Academy under his direction and these have been simplified so that his duties are now general and not specific.

The new By-Laws make the work of the Board of Trustees much more simple in handling the funds of the Academy. They also properly safeguard the interests of the Academy.

A special committee on the revision of the Constitution and By-Laws is now at work in redrafting the entire Constitution and By-Laws. This Committee consists of Dr. Herbert S. Carter, Chairman, Dr. Fenwick Beekman, Dr. John A. Hartwell, Dr. Royal S. Haynes and Dr. Linsly R. Williams.

Changes in the By-Laws referring to the Committee on Admission, the Committee on Medical Education, and the Public Health Committee are being referred to these respective committees for criticism and suggestion.

It will be a matter of many months before the final changes will be acted upon by the Council and referred to the Academy for adoption.

During the past year the Academy has had many requests from various societies and agencies for permission to make an appeal for funds before a Stated Meeting or Section Meeting of the Academy. At a meeting of the Council on February 25, it was decided by an appropriate resolution, that no matter how

worthy the cause, the Stated Meetings or Section Meetings could not be utilized for the purpose of fund raising or for the presentation of requests for funds from other societies or institutions.

SALE OF THE PRESENT ACADEMY BUILDING

During the past two years the Academy has received repeated offers for the present premises and the Fellows of the Academy by appropriate resolution have authorized the sale. The Trustees have desired to safeguard the Fellows of the Academy in every way possible, and to obtain the best price possible. Prominent real estate brokers in the city, entirely disinterested, advised the Academy a year ago to sell the premises for $600,000.

A contract for sale has just been signed by the President of the Academy for $745,000 for future delivery. In accordance with the terms of the contract, the Academy is bound to deliver the property on May 1, 1927, or on any date between January 1, 1928, and May 1, 1928. From present indications it would seem that the new building would be open prior to May 1, 1927, but at the request of the Trustees, the contract was so arranged that delivery could be delayed over a year in case of any untoward circumstances arising which might postpone the completion of the new building.

DEATHS OF FELLOWS OF THE ACADEMY

William E. Boyce, 95 Radford Street, Yonkers, New York; graduated from New York University and Bellevue Hospital Medical College, New York City, 1903; elected a Fellow of the Academy March 5, 1908; died January 28, 1925.

Norman Hayes Probasco, 621 Park Avenue, Plainfield, N. J.; graduated from the College of Physicians and Surgeons, New York City, 1898; elected a Fellow of the Academy March 5, 1902; died April 6, 1925.

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